

## **Problem: Unstructured Data Analysis of Educational Learning Objectives**

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### **Project Overview**

#### **Motivation**

[IBM Skills Build](#) is IBM's flagship offering to university students to provide methods and technology skills in demand by industry. There is a challenge though – the contents of the Skills Build Initiative are pretty involved and complex – and extremely challenging for someone who is just starting an academic course – and looking for complimentary learning and tools.

#### **Objective**

Create a tool, which would take as input a description of a HE, University course that a student was taking, then perform an analysis of IBM Skills Build, identifying those learning experiences that would be relevant to the students current learning objectives. The tool would then provide a set of links to those learning experiences for the student to follow.

This project would require some analysis of Skills Build and potentially to export out text descriptions of the tools and the tutorials - so they could be accessible to the tool that the students would build to perform the analysis and comparison.

The project solution would also require the ability to allow the user to input a significant amount of unstructured data (description of the course), and the ability to analyse this unstructured data – extracting key themes and topics. The key themes and topics extracted, would then be compared to the analysis of the Skills Build courses and tools – revealing matches between the users course topics and themes, and the learning topics of Skills Build. The project solution would then output the Topics and Themes of the course the user is engaged in, along with links to the matched learning experiences from Skills Build that will complement the course.

#### **Ideal project output/deliverable**

A system that will provide to the end user a set of relevant and complementary learning experiences from IBM Skills Build and the IBM Academic Initiative to support their current learning journey.

# Solution Guide

## Setting up

1. Register and login on [IBM Skills Build](#).
2. Review the Skills Build content to identify the areas of interest in terms of:
  - a. Project learning
  - b. Personal learning
3. Setup Trello Boards:
  - a. Create a Learning Plan Trello board for:
    - i. links to the identified items/areas of relevance from Skills Build and text descriptions for the learning experiences
    - ii. Text descriptions of a HE/University course
  - b. Create a Project Plan Trello board for this project
4. Setup local and remote (Github) git repositories for the project.

## Intermediate helpful steps

- Create a (*JavaScript*) chatbot with predefined (example) questions and answers.
- Investigate/Implement an NLP (Natural Language Processing) model (*Tensorflow*) for text analysis in order to:
  - Extract key themes/concepts and terms from the IBM Skills Build/IBM Academic Initiative. (*This would only need to be performed once. Store these terms with their links to the learning experiences*).
  - Extract key themes/concepts and terms from the description of a HE/University course.
  - Compare the analysis of the two steps above to determine where there is a match. (*Automatically OR by the user by way of radio buttons*).
- Incorporate the NLP model in the chatbot (*Tensorflow.js*)
  - Input:
    - Unstructured data reflecting the contents of the IBM Skills Build/IBM Academic Initiative.
    - Unstructured data reflecting the description of the learning journey/course.
  - Output:
    - The matching key terms and relevant links to the learning content in the IBM Skills Build/ Academic Initiative.
    - (Option) Provide a visualisation of the matches.
- (Option) Instead of a chatbot: build a tool, which would allow a user to:
  - Input a text description of their course (perhaps c/p from a prospectus).
  - Receive as Output a list of links to learning artifacts that are contained within IBM Skills Build which are specifically relevant to their course.

## Finishing up

- Write documentation/manual of the project in LaTeX
- Prepare a short presentation of the project in reveal.js